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Following recommendations in the 1966 report EDUCATION AT BERKELEY, the Board of Educational Development (BED) was created as the practical vehicle through which experimental curricular programming could be realized more rapidly. The purpose of this study was to examine systematically and empirically the BED curriculum--the student and faculty initiated courses sponsored by the Board. It was found that of the 36 courses given from Winter Quarter 1967 through Summer Quarter 1968, almost 60% were initiated by students. Wide variation in class size was noted. Broad social problems dominated the content of the BED curriculum with the emphasis favoring a theoretical orientation over specific application of theory. There were no significantly peculiar patterns of course enrollment size in terms of the 3 course initiator groups--the Center for Participant Education (a student group), faculty, and students. Neither class size nor course load (estimated in terms of unit credit per course) significantly affected grades. Higher grades were earned in student initiated courses. BED courses showed significantly higher grade point indices than comparable undergraduate courses across campus, but in terms of course initiators and broad academic fields, the grade point indices of BED courses were not significantly different. Appendices contain course descriptions and tables. (JS)

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UNIVERSITY OF CALIFORNIA

Office of Institutional Research

THE CURRICULUM OF THE BOARD OF EDUCATIONAL DEVELOPMENT: SOME EMPIRICAL FINDINGS

by

James Steve Counelis

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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A C K N O W L E D G E M E N T S

I wish to acknowledge the competent services of Mrs. Alice Guy, computer programmer on the staff of this Office. Through her aid, a significant contribution was made. Also, I wish to acknowledge with thanks the constructive and critical reading of this report by Mr. Sidney Suslow, Director of this Office. Of course, the interpretation and errors rest with this writer.

James Steve Counelis

Office of Institutional Research,
University of California, Berkeley,
July 14, 1969

A SUMMARY OF FINDINGS

1. The 36 Board of Educational Development courses under study have significantly higher Grade Point Indices (GPI) than comparable undergraduate courses across campus.

2. The Grade Point Indices (GPI) for these Board of Educational Development courses are essentially independent of the factors of class size and course load, the latter defined in terms of units of credit earned per course.

3. In terms of course initiator groups and broad academic fields, the Grade Point Indices (GPI) of these Board of Educational Development courses are not significantly different, hence, grading is consistent within the BED curriculum.

THE CURRICULUM OF THE BOARD OF EDUCATIONAL DEVELOPMENT

SOME EMPIRICAL FINDINGS

by

James Steve Counelis

I

The Board of Educational Development is a product of the findings generated by the Berkeley Division's Academic Senate Select Committee on Education, headed by English Professor Charles Muscatine. Education at Berkeley, the 1966 report of this committee, indicates that this Board was to become the practical vehicle through which experimental curricular programming would become possible more readily.[1] The Board of Educational Development was created and began its work. The first courses mounted under its sponsorship were given in the Winter Quarter 1967.

The purpose of this study is to look systematically and empirically at the curriculum of the Board of Educational Development namely, the student and faculty initiated courses sponsored by the Board. In late 1968, a report prepared by the Office of Institutional Research was published on the grading of BED courses in comparison with other similar courses by field and level. The period under study was from Winter Quarter 1967 through Summer Quarter 1968. This OIR report suggested by comparative proportions that BED courses tended to have higher grade

point levels.[2] In response to this report, Professor John Kelly, then Chairman of the Board of Educational Development, suggested that comparability had not been attained because "Class size has a profound influence on grade distributions."[3] In the following, these hypotheses will be more intensively explored.

II

The designed mission of the Board of Educational Development was to stimulate and promote experimentation in all sectors of the Berkeley campus; and to receive, encourage, and authorize experimental instructional proposals for which neither departmental nor college support was appropriate or feasible. In fulfilling this later function, the Board was empowered to initiate and administer such experimental programs pending their adoption by a department or other recognized faculty group. In fulfilling its charge, the Board encouraged students and faculty to submit course proposals. The ASUC Center for Participant Education and other ad hoc student groups submitted course proposals as well as did the faculty. Courses in jazz, the mediaeval monestary, social research methodology, honors mathematics, creative writing, literature of social protest, mysticism, community action, and social philosophy were among the interdisciplinary offerings during the first seven quarters of operation.

From the Winter Quarter 1967 through the Summer Quarter

1968, some 36 courses were given. Chart No. 1 provides a detailed listing of these courses. The Center for Participant Education initiated seven courses or about 19 per cent of the original 36 BED courses. The faculty initiated about 42 per cent or 15 courses. Students other than those incolved in the ASUC's Center for Participant Education initiated 14 courses or about 40 per cent. If the student groups are pooled, they were found to be responsible for mounting almost 60 per cent of the original 36 BED courses.[4] See Chart No. 1 (pp. 23-24) and a list of course content descriptions (pp. 16-22) in the Appendix.

These initial 36 BED courses were programmed in apparently consistant time pattern. Chart No. 2 (p.25) presents this pattern. It seems that the spring quarters tended to be more heavily programmed than other quarters. The reason for this calendrical regularity was not inquired into bacause it was not germane to this study's concerns. See Chart No. 2 (p.25) in the Appendix.

The distributional pattern of BED courses by class size categories is presented in Chart No. 3. (p.26) with detailed supporting charts. At one end of the scale, one-third of the BED courses were in the 1-9 class size category, these courses servicing 8.1 per cent of the 803 students in the BED program for the time period under discussion. At the other end of the spectrum of class size, three courses (8.3%) serviced 34.4 per cent (284 students) of 803 students in the program. The BED courses had wide variation in class size, ranging from 1 to 123 students, indicating a flexible response in terms of course character and popular demand. See Chart No.3 (p.26) and supporting charts (pp.27-28) in the Appendix.

Inasmuch as the classes mounted by the course initiators reflect broad fields of current curriculum concern, Chart No. 4 (p.29) catalogues these courses in terms of the initiators and the broad academic fields. By far, the courses with social sciences' content predominate within the BED curriculum while the professional fields are represented only by two courses in environmental design and these being broadly structured problem solving courses. The humanities are represented by both skills and substantive courses. Of the skills courses, French 4X and creative writing are found. The later category contains courses in music and literature biased by strong social interests. "A scruting of the natural sciences"; courses reveals that mathematics dominates here. No courses in physics and chemistry are found; and only two courses in the biological sciences were given. Certainly a reading of the courses' descriptions provides the fair characterization that broad social problems dominate the content of the BED curriculum with the possible exception of courses in mathematics, sociological method, mysticism, creative writing and French 4X. See Chart No. 4 (p.29) in the Appendix.

One other curricular observation can be made. An analysis of the course descriptions suggests that theoretical courses (80.6%) dominated the BED curriculum. Practical courses, wherein the curricular emphasis was in training and applying intellectutal, social or phychomotor skills, constituted about 19 per cent or seven courses. The current emphasis of the courses mounted favors a theoretical orientation over the specific application of theory. Whether the university's traditional orientation toward curriculum biases the acceptance of courses in this particular manner has not been inquired into inasmuch as it was not the concern of

this study. But such an affective question is researchable; and the results would be of some interest to the Board. See Chart No. 5 (p.30) in the Appendix.

On the Berkeley campus, there are three grading practices associated with undergraduate courses. Letter grades, letter grades with the student declared option for a P/NP grade and the non-option P/NP grade constitute these practices. With reference to the BED curriculum, the frequency of use of these grading practices are categorized by course initiator group in Chart No. 6 (p.31) found in the Appendix. It occured to this writer that the possibility of choice of grading practice could be associated with particular course initiators. The null hypothesis that no association existed between grading practice and course initiator was posed. A chi square test of this hypothesis suggested that for the BED courses no association at the one per cent level existed. Hence, the null hypothesis was retained. See Chart No. 7 (p.32) in the Appendix for details of statistical computation.

Empirical data on the BED curriculum consists also of units of credit earned by students per course, the number of students per course, and the grade point index. This last measure, abbreviated GPI, is a weighted mean. Depending upon the logical set under discussion (In this paper, the logical sets are "the course" and "the course initiator group.") the GPI is calculated in the following manner:

$$GPI = \Sigma G_n P_n / N;$$

G_n: frequency of each letter grade, e.g., A's, B's, etc.;

P_n: grade points (weights) for each letter grade;

N : total number of letter grades within the logical set (ΣG_n).

The frequency for each letter grade (G_n) is multiplied by the appropriate grade point weight (P_n), [5] these products added and the sum divided by the total number of letter grades in the set. An analysis of the GPI's given in Chart No. 6 (p 31) found in the Appendix, will come later. But first, a discussion of the units and students per course will be undertaken.

In terms of the average number of units earned, the student initiated courses with a mean 6 4 units per course led. CPE initiated courses came in second place with a mean of 4.1 units per course. Trailing faculty initiated courses had a mean of 3.8 units per course. See Chart No 6 in the Appendix. The null hypothesis that these means did not differ significantly from the overall means of 4.9 units per course was tested by Student t statistic. At the one per cent level, these means were found to differ. Thus there were no significantly peculiar patterns of course load in terms of the three given course initiator groups. See Chart No. 8 in the Appendix for data and computation results.

For the period under discussion (Winter Quarter 1967 through Summer Quarter 1968), 803 students took the initial 36 BED courses. CPE initiated course attracted the fewest students. Their number were 119 or about 15 per cent. Three hundred students, 37.4 per cent, were in the faculty initiated courses And almost 48 per cent had enrolled in the student initiated courses, the number being 484 students The mean for each of these initiator groups is: (1) CPE initiated courses: 17 students per course; (2) Faculty initiated courses: 20 students per course; (3)

Student initiated courses: 27.4 students per course. See Chart No. 6 (p.31) in the Appendix. When these means of the several course initiator groups are compared with the overall mean of 22.3 students per class, no difference was found at the one per cent level of significance. Thus, it can be surmised that there were no significantly peculiar patterns of course enrollment size in terms of three given course initiator groups. See Chart No. 9 (p.34) in the Appendix for data and computationed results.

It is a widely held notion that both class size and course load (expressed in terms of earned units of credit per course) are singnificant determinants of grades. These two factors were emprically tested. The hypotheses were stated as follows:

(1) Mean GPI per course is affected by class size.

(2) Mean GPI per course is affected by course load (expressed in units of credit per course).

A multiple regression analysis was undertaken. For all of the BED courses taken as one group and for each course initiator group taken separately, no significant effect was found to bear upon the GPI per course for either the factor of class size or the factor of course load in terms of unit credit per course. Given a randomly selected population of college students, the results might have been otherwise. However, Berkeley students are not randomly selected. Thus plausibly, the competence levels of the Berkeley students could preclude a finding of significant effect of these factors of class size and course load in terms of unit grade. This later hypothesis needs testing. Nonetheless,

it is reasonable to conclude that both class size and course load are independent factors in relation to GPI for this group of courses under study. See Chart No. 10 (p.35) in the Appendix for the detailed results.

Certain questions about the grading patterns of BED courses require resolution. These questions are:

(1) What is the frequency distribution of grades for the BED curriculum?

(2) Does the grading of BED courses differ significantly within the program in terms of course initiator groups and fields of study?

(3) Does the grading of BED courses differ significantly from that of comparable courses across campus?

These questions will be resolved in the ensuing discussion on terms of descriptive presentation and the empirical testing of hypotheses.

Chart No. 11 (p.36) in the Appendix presents a frequency distribution of all grades earned by the 803 students in the BED curriculum under study. The GPI per each course initiator group and for all students in the BED curriculum were calculated. The order from highest to lowest CPE is as follows: (1) GPE course students: 3.53 grade points; (2) Students' initiated courses: 3.46 grade points; (3) Faculty courses': 3.28 grade points. This is the identical order of initiator groups found when the averages of the GPI per course for each course initiator group are compared See Chart No. 6 in the Appendix for these comparative figures. Hence as a group, student created courses within the BED program have generated

higher GPI's than faculty initiated courses. Whether this fact is a function of student participation in course construction is an open question at this time. It is a researchable question in which the Board will find some interest.

Does the pattern of passing and failing in BED courses differ significantly from that found across the whole campus? This question is resolved by an inspection of Chart No. 12 (p.37) in the Appendix. A comparison of proportions in passing and failing grades is made therein. The comparision indicates an almost identical pattern of pass/fail proportions for the BED courses and undergraduate courses across the campus. However, P/NP grading is more stringent in the BED curriculum than that found in other Berkeley undergraduate course. BED courses had five per cent fewer P grades than the undergraduate curriculum campus-wide. On the criterion of pass/fail, the BED course do not appear out of line in terms of total campus practice, though P grades appear to be more difficult to earn in the BED curriculum. The reason for this is not apparent on the basis of our data. However, it might be a function of both faculty and student inability to gauge a "minimum" base point for evaluating passing and not passing without some mode of scaling implied by letter grading practices.

With the differences in GPI's calculated for each initiator group on two bases, the following hypothesis is suggested for testing:

> The GPI's for the three groups of course initiators do not differ significantly.

This null hypothesis was tested by a one-way analysis of variance study.

Having tested the normality of the GPI distribution and the homogeneity of variance by chi square test and Bartlett's test, respectively, the analysis of variance indicates that the means of the GPI per course initiator group did not differ significantly. Hence, the grading of BED courses by the faculty was consistant within the program. See Charts Nos. 13 and 13A-13E (pp. 38-43) in the Appendix for the data and the details of computation.

The further question as to whether there was any difference in grading within the BED curriculum in terms of knowledge fields needs exploration. The following null hypothesis was posed and tested:

> The GPI's for the three academic field groups (natural sciences, social sciences and the humanities) do not differ significantly.

As before, this hypothesis was tested by a one-way analysis of variance procedure. Following the previous method, the results of this analysis of variance study was an acceptance of the null hypothesis. No statistically significant differences were found to exist among the mean GPI's for the three academic field groups of courses in the BED curriculum. Thus consistancy in grading appears within the BED program across all the academic fields as well. See Charts Nos. 14 and 14A-14D (pp.44-48) in the Appendix for the datal and computational details.

The final question requiring solution is the comparability of grading of BED courses with all-campus practice. Since the system of plus and minus grades was introduced during the Summer Quarter 1967, the comparisons must be made for the period of Summer 1967 through Summer 1968.

This eliminated 14 BED courses taken during the Winter and Spring Quarters of 1967.

A Student's t test was applied to the GPI's for each group of courses. The GPI for the BED courses was 3.35 grade points. The GPI for the comparative undergraduate courses was 2.79 grade points. The difference of .56 grade points was found, statistically, to be significant at the one per cent level. Therefore, the overall BED grade levels were significantly higher than comparable undergraduate courses across campus. See Chart No. 15 (p.49) for the statistical details.

III

This empirical study of the curriculum of the Board of Educational Development has found the following facts:

(1) The 36 Board of Educational Development courses under study have significantly higher Grade Point Indices (GPI) than comparable undergraduate courses across campus.

(2) The Grade Point Indices (GPI) for these Board of Educational Development courses are essentially independent of the factors of class size and course load, the latter being defind in terms of units of credit earned per course.

(3) In terms of course initiators and broad academic fields, the Grade Point Indices (GPI) of the Board of Educational Development courses are not significantly different.

These results leave us with the problem of explainingthe BED curriculum's higher grades. Two sets of hypotheses, requiring testing, come to mind. One set centers around the nature of the students in the BED curriculum. The other set of hypotheses has its focus upon the BED faculty. Both sets of hypotheses have in common the factor of the possible upward biasing of

GPI's through faculty and student autoselected participation in the BED curriculum. These hypotheses are:

I. Faculty:

A. The experimental character of the curriculum of the Board of Educational Development selectively attracts a type of faculty person whose habitual evaluation pattern results in higher grades.

B. The experimental character of the curriculum of the Board of Educational Development effects the faculty members in such a manner as to bias upwardly their general grading pattern.

II. Students:

A. The experimental character of the curriculum of the Board of Educational Development selectively attracts a significantly more able student and thus resulting in significantly higher BED course grades.

B. Personal involvment of student and teacher in the construction of courses motivates students in such a manner so as to induce them to earn higher grades than they normally would have earned in a regular course in a similar field in which they did not participate in the course construction.

These hypotheses can be investigated empirically. But these questions were not within the scope and data of this study. To assert as some are wont to do, that these hypotheses are logical and valid explanations for the higher grades in the BED program would be to do so without the warrant of evidence. Indeed, these would be purely assertive arguments based upon silence.

This writer suggest that the Board of Educational Development sponsor research into such affective curricular questions as these and other suggested hypotheses given in this paper. We have no science

on these matters at this time. Through such science, the planning of experimental change in curriculum over time can be done within the processual dynamics that make the university curriculum what it is.

F O O T N O T E S

[1]The Academic Senate of the University of California, Berkeley, Education at Berkeley: Report of the Select Committee on Education (Berkeley, Cal.: The University of California Press, 1966). Ch. VII.

[2]Office of Institutional Research, Analysis of Grading in CPE (sic) Courses (Berkeley, Cal.: University of California, November 1968).

[3]Letter, John Kelley (Chairman, Board of Educational Development) to Sidney Suslow (Director, Office of Institutional Research), December 5, 1968.

[4]Of the 36 courses given, five of them were given twice and one course was given three times. Hence, there were 27 different courses given.

[5]The grade point weights are as follows: A+ and A, 4; A-, 3.7; B+, 3.3; B, 3.0; B-, 2.7; C+, 2.3; C, 2.0; C-, 1.7; D+, 1.3; D, 1; D-, .7; F, no points; I, no points. P and NP grades are not counted into the logical set, hence the total set is always reduced by the number of P/NP grades.

Appendix

THE BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM,

WINTER 1967 - SUMMER 1968

CENTER FOR PARTICIPANT EDUCATION
INITIATED COURSES:

Dramatic Arts 130X: 5 units
Studies in Avant Garde French Theater and Its Antecedents
Morgan Upton
Spring 1967

Readings and conferences on dramatic and critical theories of Artaud Jary, Ionesco, Genet, Camus, Sartre and others.

Literature 36X: 5 units
Mysticism: Theory and Practice
Benjamin Zablocki
Spring 1967

An exploration of the major theoretical and experimental trends in mysticism. The course will focus upon the nature of mystical experience through literature, philosophy, and psychology; and it will include an introduction to theory and method in modern and acient mystical practices.

Social Analysis 38X: 5 units
Existentialism and Freedom
Norman Jacobson
Spring 1967

A course to investigate the life-problems imposed by freedom. Appropriate reading (Kierkegaard, Nietzsche, Freud, Dostoyevsky, Camus and Eickson) assignments will aid students to understand more fully the orgin and nature of the problems and to seek possible solutions.

Musical Arts 102X: 4 units
Sociology of Rock and Roll
James T. Carey
Fall 1967

This course will trace influences of earlier musical forms and the sociological implications of mass culture in the evolution of rock and roll. It is designed to provide knowledge and insight into this music and the youth group which is its audience.

Nature Studies 136X: 5 units
The American Wilderness as Myth, Hope and Experience
James N. Anderson
Spring 1968

A course designed to study the development of wilderness impulse and idea in the United States. Both historical and current works in art, literature, sciences, exploration and government policy will be used to uncover the roots and chart the future of wilderness recreation and control.

Literature 136X: 3-5 units
Writing Seminar Workshop
F.C. Crews
Spring 1968

A course to develop writing potential and to share in the teaching and criticism of the writing of other class members; to develop valid literary standards and an understanding of the elements of poetry, fiction and literary criticism.

FACULTY INITIATED COURSES:

English 301: 3 units
Problems in the Instruction of Literature
Donald Friedman
Spring 1967

For graduate students preparing for a career in college teaching. Members of the course will serve as readers and discussion section leaders in an undergraduate course, and they must have completed satisfactorily a seminar, proseminar, or equivalent course in the subject matter covered by the undergraduate course. Weekly staff meetings with the instructor, preparation and evaluation of student exercises, and a term project report required.

Mathematics H2B-H2CX: 4 units
Second Year Calculus
Michael Schlessinger
Spring 1967

An experimental tutorial course, to be taught concurrently with the traditional, larger course in Second Year Calculus, and covering essentially identical material.

Mathematics 113AX and Mathematics 134X: 2 units/course
Modern Algebra and Number Systems
Morris W. Hirsch
Spring 1967

Two experimental tutorials to prepare able freshmen for upper division work in calculus instead of deferring such work until the usual two year calculus sequence is completed. Course content is the same as that of Mathematics 113A and Mathematics 134.

Mathematics 191X: 2 units
Multivariate Analysis
Morris W. Hirsch
Spring 1967

A special tutorial program to broaden the background and mathematical experience of able upper division students, and to provide them with material which will increase the range of fundamental mathematical tools available to them, and lead them to some fairly profound mathematical results, giving them a new perspective on the elementary mathematics of multivariate analysis.

French 4X: 6 units
Intermediate French
P.B. Augst
Spring 1967

An experimental course designed to encourage students to continue the study of the French language begun in high school, rather than switch to a new language to satisfy the foreign language requirement. Enrollment open to freshmen with three years of high school French or transfer students with 12 or less units from another institution.

Sociology 191: 5 units
Practicum in Social Research
Shirley A. Star
Spring 1967

An experimental course intended to provide students with an opportunity to integrate and consolidate their formal knowledge of sociological theory and their formal training in research methods, through realistic participation in the research process. The focus of the course will be on actual research with the aim of making concrete what the student has encountered in the abstract.

Environmental Design 110: 3 units
Experimental Student-Run Tutorials
Christopher Alexander
Fall 1967 and Spring 1968

An experimental tutorial course, each tutorial to be led by a senior or graduate student and will concern itself with stating and answering some theoretical question or problem concerning the foundation of architecture.

Arts and Science 101X: 4 units
Culture and the Individual
M.M. Loeve and others
Winter 1968

Round table discussion seminar on cultural involvement. Visiting local faculty members will participate occasionally in the discussions.

Arts and Science 101AX and 102 BX: 6-8 units
The Mediaeval Monastery: Its Architecture, Economy and Life
Walter W. Horn and others
Winter and Spring 1968

A lecture-seminar course devoted to an analysis of the monastery as an architectural, religious, cultural, manorial, administrative, and technological institution. Seminar, 2 hours; study-group, 4 hours. Credit and grade to be assigned on completion of the full sequence. Prerequisites: Strong historical interests and a reading knowledge of one of three languages: French, German or Latin. Open to students of all disciplines.

Biology 2X: 2 units
Developments in Evolutionary Thought
H.V. Daly, V.M. Sarich, and V.M. Laetsch
Spring 1968

A seminar devoted to readings and discussions concerned with the current understanding of evolutionary mechanisms. Individual projects will emphasize the interrelationship of evolutionary phenomena and contemporary social and economic problems. Enrollment limited to 24 and preference given to Freshmen.

Religious Studies 136X: 5 units
Judaeo-Christian Studies and Their Relevance to Modern Man
Raymond J. Sontag
Spring 1968

A course designed to survey acient and modern Judaeo-Christian thought and philosophy and how it relates to the modern secular world. Father Joseph Drew, Newman Hall, Reverend Ralph Moellering and Professor David Winston of the Graduate Theological Union will participate in the class discussions.

Religious Studies 138X: 4 units
Theory and Practice of Meditation
Michael Nagler
Spring 1968

An exposition of several key words in the Indian religious-phlosophical tradition supplemented by practice to techniques of Yogic meditation. This course will attempt to coordinate theory and practice of this discipline. Both aspects are normally considered essential by practitioners. Enrollment limited to 100.

Sociology 49X: 4 units
Sophomore Honors Seminar
J. Dizzard, R. Ofshe, R. Hansen and others
Spring 1968

Intensive reading and discussion of important sociological works, both theoretical and emprical. A course designed to give special opportunity to students who have done well in introductory sociology classes to continue with sociology in seminar form.

Mathematics 100X: 2-4 units
Tutorial Methods of Teaching and Learning
M.M. Loeve
Summer 1968

To study the process of teaching and learning calculus while serving as tutors in lower division calculus classes. Class meetings will be devoted to a careful analysis of what is happening in the tutorial sections, with discussion of related materials on both mathematics and education. Prerequisites: Mathematics H11C, H12A, or 104A and consent of the instructor.

STUDENT INITIATED COURSES:

Literature 39X: 2 units
Literature and Cataclysm
J. Breslin
Winter 1967

A study of literature written during and after periods of social upheaval. Discussion will center around the theories and insights presented by selceted authors, including Hemingway, Joyce, Kafka, Mann, Lawrence, Mailer, Camus, and Sartre; and will emphasis the context of the times in which the books were written, the responses of the individual as well as society as a whole to fundamental changes in the social order.

Mathematics H2B-H2CX
Mathematics 113AX & 134X
Mathematics 191X

See all three courses described in the section on Faculty Initiated courses. It appears that student initiation of these courses occured in the Winter 1967 Quarter.

Political Science 198X: 5 units
Experimental Studies in Politics-Modern Organizations
R. Biller
Summer 1967

An examination of how organizations can be more effective, adaptive and creative through collaboration among people of all levels.

Social Analysis 167X: 10 Units
Summer Residence College
A.C. English & Staff
Summer 1967

Small-group studies of the historical, political, sociological, geographical, and cultural aspects and problems of the modern city.

Social Analysis 168X: 8 units
Study of Poverty and Ghetto Life
Lawrence E. Grossman
Summer 1967

Analysis of the organization of the Black Ghetto, the roles of existing institutions, the culture engendered and of potential social planning solutions. Students will live in selected homes in the Oakland poverty area.

Social Analysis 136AX, BX, CX: 1-5 units
Social and Behavioral Factors in College Commitment
Robert Blauner
Fall 1967 and Winter and Spring 1968

A critical evaluation of social and behavioral problems of academic achievement among minority students with major emphasis being placed on the Negro, Mexican-American, and American Indian and other low-income students. The team approach is used to provide the theoretical and empirical framework for discussion and application of basic principles.

Social Analysis 130X: 10 units
Education of Deaf Mexican Children
Ward E. Tabler
Spring 1968

Field study course to develop a practical ability to teach and work with deaf children at the School of Deaf Children at Tijuana, Mexico. Students will live in local homes while tutoring and studying at the School, thus giving them an added opportunity to lear something of Mexican culture. An Amigos "68 Project.

Social Analysis 133X: 15 units
The Politics of Race Relations
Carl Werthman
Spring 1968

This course will study the structural, ideological, and social psychological dynamics of the political process surrounding the scheduled demonstration called by Dr. Martin Luther King, in Washington D.C. Students will conduct field research on the leadership of the demonstration, as well as the response of the local Negro population, Congress, the White House, the press and the police. The course will be held on the Berkeley campus during the first week of the spring quarter, and in Washington D.C. at the Institute for Policy Studies during the remainder of the spring quarter. Maximum enrollment: 40 students. Prerequisite: Consent of the instructor.

Social Analysis 134X: 12 units
Youth in the Changing Urban Community
Troy Duster
Summer 1968

A tutorial course, taken concurrently with participation in community organization, to be taught in the Mission District in San Francisco. Designed primarily for upper division students with community organizing and/or minority group experience, to bridge the gap between academic learning relative to problems of minority communities and minority status, values and experience. Prerequisite: Consent of Instructor.

Social Analysis 167X: 10 units
Summer Residence College
John H. Schaar and Staff
Summer 1968

General theme of the College this year will be Modern Man and His Environment. As in Summer 1967, the purpose is to create a total learning environment for both faculty and students in order to enhance the personal commitment to the pursuit of teaching and learning. Instruction will be on a small group tutorial basis, students to meet in small groups once or twice weekly. Emphasis will be devided between formal group study with tutor, and individually directed research in an area of mutual interest to student and tutor. Each faculty member has outlined an intellectual topic and syllabus which will form the basis of his tutorial. Individual student research project will be confined to the broad area as outlined by his tutor.

CHART NO. I

BOARD OF EDUCATIONAL CURRICULUM, SPRING 1967 TO SUMMER 1968: A SUMMARY CHART.

COURSES	QUARTER	UNITS	STUDENTS LET GRA	P/NP	TOTAL	COURSE EMPHASIS	GPI
CENTER FOR PARTICIPANT EDUCATION INITIATED COURSES:							
1. Dramatic Arts 130X	Sp 67	5	7	-	7	T	3.73
2. Literature 36X	Sp 67	5	24	-	24	T	3.60
3. Social Analysis 38X	Sp 67	5	9	-	9	T	4.00
4. Social Analysis 138X	Sp 67	1	1	-	1	T	4.00
5. Musical Arts 102X	F 67	4	30	-	30	T	3.03
6. Nature Studies 136X	W 68	5	16	-	16	T	4.00
†7. Literature 136X	Sp 68	3-5	-	29	29	P	----
FACULTY INITIATED COURSES:							
8. English 301	Sp 67	3	5	-	5	P	3.94
9. Mathematics H2B-H2CX	Sp 67	4	6	-	6	T	3.05
10. Mathematics 113AX & 134X	Sp 67	2	24	-	24	T	3.67
‡11. Mathematics 191X	Sp 67	2	9	1	10	T	4.00
†12. French 4X	Sp 67	6	-	7	7	T	----
13. Sociology 191	Sp 67	5	3	-	3	P	3.77
‡14. Environmental Design 10X	F 67	3	20	1	21	T	3.29
†15. Arts and Sciences 101X	W 68	4	-	24	24	T	----
16. Arts and Sciences 102AX & 102BX	Sp 68	6-8	17	-	17	T	3.08
‡17. Biology 2X	Sp 68	2	11	1	12	T	3.55
†18. Environmental Design 110X	Sp 68	3	-	43	43	T	----
19. Religious Studies 136X	Sp 68	5	19	-	19	T	3.14
†20. Religious Studies 138X	Sp 68	4	-	91	91	P	----
21. Sociology 49X	Sp 68	4	11	-	11	T	2.30
22. Mathematics 100X	S 68	2-4	7	-	7	P	4.00

STUDENT INITIATED COURSES:

23.	Literature 39X	W	67	2	3	-	3	T	4.00
24.	Mathematics H2B-H2CX	W	67	4	6	-	6	T	2.88
25.	Mathematics 113AX & 134X	W	67	2	30	-	30	T	3.48
26.	Mathematics 191X	W	67	2	15	-	15	T	3.92
27.	Political Science 198X	S	67	5	16	-	16	T	2.99
‡28.	Social Analysis 167X	S	67	10	41	29	70	T	3.57
29.	Social Analysis 168X	S	67	8	9	-	9	T	3.49
30.	Social Analysis 136AX-BX-CX	F	67	1-5	23	-	23	T	3.40
31.	Social Analysis 136AX-BX-CX	W	68	1-5	11	-	11	T	3.87
32.	Social Analysis 130X	Sp	68	10	2	-	2	P	4.00
33.	Social Analysis 133X	Sp	68	15	33	-	33	T	2.97
34.	Social Analysis 136AX-BX-CX	Sp	68	1-5	29	-	29	T	3.75
35.	Social Analysis 134X	S	68	12	14	-	14	T	3.25
‡36.	Social Analysis 167X	S	68	10	100	23	123	P	3.49

TOTAL	554	249	803

† P/NP grading only
‡ P/NP & letter grading

P = Practical emphasis
T = Theoretical emphasis

CHART NO. 2

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, WINTER 1967 TO SUMMER 1968:
COURSE DISTRIBUTION BY INITIATORS AND QUARTERS

QUARTER & YEAR		COURSE INITIATORS			TOTAL
		CPE	FACULTY	STUDENTS	
Winter	1967	-	-	4	4
Spring	1967	4	6	-	10
Summer	1967	-	-	3	3
Fall	1967	1	1	1	3
Winter	1968	1	1	1	3
Spring	1968	1	6	3	10
Summer	1968	-	1	2	3
TOTAL		7	15	14	36
		19.4%	41.7%	38.9%	100.0%

CHART NO 3: BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM: COURSE AND STUDENT DISTRIBUTIONS BY CLASS SIZE CATEGORIES

CLASS SIZE CATEGORIES	BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM			
	COURSES		STUDENTS	
	N	%	N	%
1 - 9	12	33.3	65	8.1
10 - 19	10	27.8	141	17.5
20 - 29	7	19.4	174	21.7
30 - 39	3	8.3	96	11.9
40 - 49	1	2.9	43	5.4
50+	3	8.3	284	35.4
TOTAL	36	100.0	803	100.0

CHART NO. 3A

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: DISTRIBUTION OF COURSES BY COURSE INITIATORS AND CLASS SIZE

COURSE INITIATORS	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50+	TOTAL
Center for Participant Education	1	2	-	1	1	1	1	-	-	-	-	7
Faculty	1	4	3	2	3	-	-	-	1	-	1	15
Students	2	2	2	2	1	1	2	-	-	-	1	14
TOTAL	4	8	5	5	5	2	3	-	1	-	3	36
PROPORTIONAL DISTRIBUTION	33.3%		27.8%		19.4%		8.3%		2.8%		8.3%	100.0%

CHART NO. 3B

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: DISTRIBUTION OF STUDENTS BY COURSE INITIATORS AND CLASS SIZE

COURSE INITIATORS	NUMBER OF STUDENTS PER CLASS SIZE CATEGORY											TOTAL
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25-29	30-34	35-39	40-44	45-49	50†	
Center for Participant Education	1	16	-	16	24	29	33	-	-	-	-	119
Faculty	3	25	33	36	69	-	-	-	43	-	91	300
Students	5	15	25	31	23	29	63	-	-	-	193	184
TOTAL	9	56	58	83	116	58	96	-	43	-	284	803
PROPORTIONAL DISTRIBUTION	8.1%		17.5%		21.7%		12.0		5.3%		35.4%	100.0%

CHART NO. 4

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: COURSES DISTRIBUTED BY BROAD FIELDS AND BY THE INITIATORS OF THE COURSES

FIELDS	COURSES BY INITIATORS			
	CPE	Faculty	Students	TOTAL
Natural Sciences	1	5	3	9 (25.0%)
Social Sciences	2	4	10	16 (44.4%)
The Humanities	4	4	1	9 (25.0%)
Professional	-	2	-	2 (5.6%)
TOTAL	7 (19.4%)	15 (41.7%)	14 (38.9%)	36 (100.0%)

CHART NO. 5

BOARD OF EDUCATION DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: COURSES DISTRIBUTED BY CONTENT TYPE AND BY THE INITIATORS OF THE COURSES

COURSE INITIATORS	PREDOMINANT CONTENT		
	Theoretical	Practical	TOTAL
Center for Participant Education	6	1	7
Faculty	11	4	15
Students	12	2	14
TOTAL	29 (80.6%)	7 (19.4%)	36 (100.0%)

CHART NO. 6

BOARD OF EDUCATION DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: EMPIRICAL VARIABLES

COURSE INITIATOR GROUPS	NUMBER OF COURSES WITH			EMPIRICAL VARIABLES				
	Letter Grades Only	P/NP Grades Only	Letter Grade + P/NP	TOTAL	Mean Number Units/Course	Mean Number Students / Course	Mean GPI/ Course	GPI / Course Initiator Group
Center for Participant Education	6	1	-	7	4.1	17.0	3.73	3.53
Faculty	8	4	3	15	3.8	20.0	3.44	3.28
Students	12	-	2	14	6.4	27.4	3.50	3.46
ALL GROUPS	26	5	5	36	4.9	22.3	3.52	3.43

CHART NO. 7

BOARD OF EDUCATION DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968:
TEST OF CORRELATION BETWEEN GRADING PRACTICES AND COURSE INITIATORS

GRADING PRACTICES	COURSE INITIATORS		TOTAL
	CPE † STUDENTS	FACULTY	
Letter Grades / Letter Grades † P/Np	20	11	31
P/Np Only	1	4	5
TOTAL	21	15	36

chi square = 3.8631

$H_o <$ chi square = 6.635 (1 df, .01)

CHART NO. 8 BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM: STUDENT: t
COMPUTATION CHART ---UNITS / COURSE

	COURSE INITIATOR GROUPS			
	CPE	FACULTY	STUDENT	ALL GROUPS
Number of courses	7	15	14	36
Sum of Units (ΣX)	29	57	89	175
$(\Sigma X)^2$	841	3249	7921	30,625
ΣX^2	133	247	813	1,193
Mean	4.1	3.8	6.4	4.9

(CPE) t = 1.4459 (t_o = 3.608, 6 df., .01

(FAC) t = 2.8909 (t_o = 2.936, 14 df., 01)

(STU) t = 1.2870 (t_o = 2.969, 13 df., .01)

CHART NO. 9 BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM: STUDENT ⅋
COMPUTATION CHART --- STUDENTS/COURSE

	COURSE INITIATOR GROUPS			
	CPE	FACULTY	STUDENT	ALL GROUPS
Number of course	7	15	14	36
Sum of Students (ΣX)	119	300	384	803
$(\Sigma X)^2$	14,161	90,000	147,456	644,809
ΣX^2	2,893	12,906	24,316	40,115
Mean	17.0	20.0	27.4	22.3

(CPE)t = 1.1645 (t_o = 3.608, 6 df., .01)
(FAC)t = .4011 (t_o = 2.936,14 df., .01)
(STU)t = .5862 (t_o = 2.969, 13 df., .01)

CHART NO. 10

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: MULTIPLE REGRESSION STUDY

COURSE INITIATOR GROUPS	Number of observations	Dependent Variable	Independent Variables	Regression Equation	Correlation Coefficient	F Test Significance Level	Standard Error of Net Regression Coefficients
Center for Participant Education	6	GPI/Course	Units/Course (X_1); Students / Course (X_2)	$X_3 = 3.92 - .066X_1 - .032X_2$	.717	.157	$X_1 = .082$ $X_2 = .012$
Faculty	11	X_3	X_1 ; X_2	$X_3 = 4.23 - .153X_1 - .020X_2$	.323	.263	$X_1 = .100$ $X_2 = .023$
Students	14	X_3	X_1 ; X_2	$X_3 = 3.70 - .030X_1 - .0003X_3$	.348	.493	$X_1 = .0026$ $X_2 = .0045$
All Initiator Groups	31	X_3	X_1 ; X_2	$X_3 = 3.71 - .031X_1 - .002X_2$	.111	.319	$X_1 = .026$ $X_2 = .0046$

CHART NO. 11

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, WINTER 1967 TO SUMMER 1968: FREQUENCY DISTRIBUTION OF GRADES AND GPI/GROUP OF INITIATORS

COURSE INITIATOR GROUPS	Number of Courses	GRADES													TOTAL	GPI/ GROUP
		A	A-	B+	B	B-	C+	C	C-	D	F	I	P	NP		
Center for Participant Education	7	38	9	8	31	1	-	-	-	-	-	-	32	-	119	3.53
Faculty	15	67	17	9	19	5	2	3	1	-	1	11	139	26	300	3.28
Students	14	163	65	36	27	11	3	7	3	-	-	17	50	2	384	3.46
All Groups	36	268	91	53	77	17	5	10	4	-	1	28	221	28	803	3.43

CHART NO. 12

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM AND LOWER DIVISION AND UPPER DIVISION COURSES, WINTER 1967 TO SUMMER 1968: PROPORTIONAL COMPARISON OF GRADES

COURSE GROUPS		A thru D	F + I	TOTAL	P	NP	TOTAL	TOTAL
CPE	N	87	--	87	32	--	32	119
	%	100.0	--	100.0	100.0	--	100.0	14.8
FACULTY	N	123	12	135	139	26	165	300
	%	91.1	8.9	100.0	84.2	15.8	100.0	37.4
STUDENTS	N	315	17	332	50	2	52	384
	%	94.9	5.1	100.0	96.2	3.8	100.0	47.8
TOTAL	N	525	29	554	221	28	249	803
	%	94.8	5.2	100.0	88.8	11.2	100.0	100.0
LOWER & UPPER DIVISION COURSES	N	286,150	16,047	302,197	37,121	2,594	39,715	341,912
	%	94.7	5.3	100.0	93.5	6.5	100.0	100.0

CHART NO. 13B

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, WINTER, 1967 TO SUMMER 1968: ONE WAY ANALYSIS OF VARIANCE STUDY OF COURSES BY INITIATOR GROUPS

	INITIATOR GROUPS			
Statistics	CPE	FACULTY	STUDENTS	All Fields
N	6	11	14	31
$\sum X$	22.36	37.79	49.06	109.21
$(\sum X)^2$	499.97	1428.08	2406.88	4334.93
$\sum X^2$	84.05	132.57	173.80	390.42
Mean	3.73	3.44	3.50	3.52
s^2	.121	.250	.134	.183
s	.348	.500	.366	.428

ONE WAY ANALYSIS OF VARIANCE

	Sum of Squares	df	Mean Square	F (2,28)	F Test Sig. Level
Category Means	.3380	2	.169	.884	Not Sig. at .01 level
Within Categories	5.3490	28	.191		
Total	5.6870	30			

CHART NO. 13A

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: TESTING THE NORMALITY OF DISTRIBUTION OF GPI/COURSE VARIABLE - ALL INITIATOR GROUPS

GPI/COURSE CATEGORIES	CATEGORY BOUNDARIES (X)	z FOR CATEGORY BOUNDARIES: $\frac{x - \bar{x}}{s}$	AREA UNDER NORMAL CURVE, 0 -- z	AREA FOR EACH CATEGORY	Calculated	Theoretical	Observed
	4.495	2.2780	.4887				
4.00-4.49				.1222	3.8	4	7
	3.995	1.1098	.3665				
3.50-3.99				.1542	4.8	5	9
	3.495	.0584	.2123				
3.00-3.49				.6011	18.6	19	11
	2.995	-1.2266	-.3888				
2.50-2.99				.1030	3.2	3	3
	2.495	-2.3949	-.4918				
2 00-2.49				.0030	.2	-	1
	1.995	-3.5631	-.4998			31	31

$\bar{X} = 3.52$

chi square = 8.8184 (2 df)

$H_o <$ chi square = 9.210 (2 df, . 01)

s = .428

CHART NO. 13B

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: TESTING THE NORMAILTY OF DISTRIBUTION OF GPI/COURSE VARIABLE - CPE INITIATOR GROUP

GPI/COURSE CATEGORIES	CATEGORY BOUNDARIES (X)	$\frac{x-\bar{x}}{s}$ FOR CATEGORY BOUNDARIES	AREA UNDER NORMAL CURVE, 0--$\frac{x-\bar{x}}{s}$	AREA FOR EACH CATEGORY	FREQUENCIES		
					Calculated	theoretical	Observed
	4.495	2.1983	.4857				
4.00 - 4.49				.2083	1.3	1	3
	3.995	.7615	.2764				
3.50 - 3.99				.5250	3.1	3	2
	3.495	-.6753	-.2486				
3.00 - 3.40				.2340	1.4	2	1
	2.995	-3.5489	-.4998				
2.50 - 2.99				.0172	.1	-	-
						6	6

$\bar{X}$ = 3.73

chi square = 4.833 (1 df)

$H_o <$ chi square = 6.635 (1 df, .01

s = .348

CHART NO. 13C

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: TESTING THE NORMALITY OF DISTRIBUTION OF GPI/COURSE VARIABLE - FACULTY INITIATOR GROUP

GPI/COURSE CATEGORIES	CATEGORY BOUNDARIES (X)	$\underline{z}$ FOR CATEGORY BOUNDARIES $\frac{x - \bar{x}}{s}$	AREA UNDER NORMAL CURVE, 0 -- $\underline{z}$	AREA FOR EACH CATEGORY	Calculated	Theoretical	Observed
4.00 - 4.49	4.495	2.1100	.4826	.1183	1.3	1	2
	3.995	1.1100	.3643				
3.50 - 3.99				.3205	3.5	4	4
	3.495	.1100	.0438				
3.00 - 3.49				.3571	3.9	4	4
	2.995	-.8900	-.3133				
2.50 - 2.99				.1573	1.7	2	-
	2.495	-1.8900	-.4706				
2.00 - 2.49				.0275	.3	-	1
	1.995	-2.8900	-.4981			11	11

$\bar{X}$ = 3.44

chi square = 3.000 (2 df)

H_o < chi square = 9.210 (2 df, .01)

s = .500

CHART NO. 13D

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: TESTING THE NORMALITY OF DISTRIBJTION OF GPI/COURSE VARIABLE - STUDENT INITATOR GROUP

GPI/COURSE CATEGORIES	CATEGORY BOUNDARIES	$\underline{s}$ FOR CATEGORY BOUNDARIES:	AREA UNDER NORMAL CURVE, 0 --$\underline{z}$	AREA FOR EACH CATEGORY	FREQUENCIES		
					Calculated	Theoretical	Observed
	4.495	2.7186	.4966				
4.00 - 4.49				.0851	1.2	1	2
	3.995	1.3525	.4115				
3.50 - 3.99				.4075	5.7	6	4
	3.495	.0137	.0040				
3.00 - 3.49				.4102	5.7	6	5
	2.995	-1.3798	-.4162				
2.50 - 2.99				.0808	1.1	1	3
	2.495	-2.7459	-.4970				
2.00 - 2.49				.0029	---	-	-
	1.995	-4.1120	-.4999			14	14

$\overline{X}$ = 3.50

chi square = 6.666 (2 df)

$H_o <$ chi square = 9.210 (2 df, . 01) .

s = .366

CHART NO. 13E

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: BARTLETT'S TEST OF HOMOGENEITY OF MARIANCES OF COURSE-INITIATOR GROUPS

COURSE INITIATOR GROUPS	SUM OF SQS. ($f_i s_i^2$)	DF (f_i)	MEAN SQUARES (s_i^2)	LOG s_i^2	f_i LOG s_i^2	RECIPROCALS ($1/f_i$)
Center for Participant Education	.8640	6	.121	-1.08279	- 6.49674	.1667
Faculty	2.7500	11	.250	-1.39794	-15.37734	.0909
Students	1.8760	14	.134	-1.12710	-15.77940	.0714
a = 3	5.3520	31			-37.65348	.3290

$$\bar{s}^2 = \Sigma f_i s_i^2 / \Sigma f_i = .1726 \quad (\text{LOG } .1726 = -1.23704)$$

$$(\Sigma f_i) \text{ LOG } \bar{s}^2 = -38.3482$$

$$M = (2.3026) (\Sigma f_i) \text{ LOG } \bar{s}^2 - \Sigma f_i \text{ LOG } s_i^2$$

$$M = 1.5997$$

$$C = 1 + 1/3 (a - 1) (\Sigma 1/f_i - 1/\Sigma f_i)$$

$$C = 2.6726$$

chi square = M/C = .5985 $\quad H_o <$ chi square $=$ 9.210 (2 df, .01)

CHART NO. 14

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, WINTER 1967 TO SUMMER 1968: ONE WAY ANALYSIS OF VARIANCE STUDY OF COURSES IN THREE BROAD FIELDS

Statistics	FIELDS			
	Natural Sciences	Social Sciences	The Humanities	All Fields
N	9	15	6	30
ΣX	32.55	51.93	21.44	105.92
$(\Sigma X)^2$	1059.50	2696.72	459.67	4215.90
ΣX^2	119.15	183.02	77.44	379.61
Mean	3.62	3.46	3.57	3.53
s^2	.178	.31	.166	.195
s	.422	.481	.407	.441

ONE WAY ANALYSIS OF VARIANCE

	Sum of Squares	df	Mean Square	F Test	
				F (2,27)	Sig Level
Category Means	.0790	2	.0395	.1917	Not Sig.
Within Categories	5.5628	27	.2060		at .01 Level.
Total	5.6418	29			

CHART NO. 14A

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: TESTING THE NORMALITY OF DISTRIBUTION OF GPI/ COURSE VARIABLE - NATURAL SCIENCES GROUP

GPI/COURSE CATEGORIES	CATEGORY BOUNDARIES (X)	z FOR CATEGORY BOUNDARIES: $\frac{X - \bar{X}}{s}$	AREA UNDER NORMAL CURVE, 0 - z	AREA FOR EACH CATEGORY	FREQUENCIES		
					Calculated	Theoretical	Observed
	4.495	2.0734	.4808				
4.00 - 4.49				.1702	1.5	1	3
	3.995	.8886	.3106				
3.50 - 3.99				.4247	3.8	4	3
	3.495	- .2912	-.1141				
3.00 - 3.49				.3165	2.8	3	2
	2.995	-1.4810	-.4306				
2.50 - 2.99				.0656	.6	1	1
	2.495	-2.6658	-.4962				
2.00 - 2.49				.0037	.03	-	-
	1.995	-3.8507	-.4999			9	9

$\bar{X} = 3.62$

chi square = 4.5833 (2 df)

$H_o <$ chi square = 9.210 (2 df, .01)

s = .422

CHART NO. 14B

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: TESTING THE NORMALITY OF DISTRIBUTION OF GPI/COURSE VARIABLE - SOCIAL SCIENCES GROUP

GPI/COURSE CATEGORIES	CATEGORY BOUNDARIES	z FOR CATEGORY BOUNDARIES $\frac{X - \bar{X}}{s}$	AREA UNDER NORMAL CURVE, 0 - z	AREA FOR EACH CATE-	FREQUENCIES		
					Calculated	Theoretical	Observed
4.00 - 4.49	4.495	2.1517	.4842	.1177	1.8	2	3
3.50 - 3.99	3.995	1.1122	.3665	.3086	4.6	5	4
3.00 - 3.49	3.395	.0727	.0279	.3594	5.4	5	5
2.50 - 2.99	2.995	-.9667	-.3315	.1458	2.2	2	3
2.00 - 2.49	2.495	-2.0062	-.4773	.0214	.3	1	-
	1.995	-3.0457	-.4987			15	15

$\bar{X}$ = 3.46

chi square = 2.200 (2 df)

H_o < chi square = 9.210 (2 df, .01)

s = .481

CHART NO. 14C

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: TESTING THE NORMALITY OF DISTRIBUTION OF GPI/COURSE VARIABLE - THE HUMANITIES GROUP

GPI/COURSE CATEGORIES	CATEGORY BOUNDARIES (X)	z FOR CATEGORY BOUNDARIES $\frac{X - \bar{X}}{s}$	AREA UNDER NORMAL CURVE, 0 - z	AREA FOR EACH CATEGORY*	FREQUENCIES		
					Calculated	Theoretical	Observed
	4.495	2.2727	.4884				
4.00 - 4.49				.1376	.8	1	1
	3.995	1.0442	.3508				
3.50 - 3.99				.4222	2.5	3	3
	3.495	- .1842	.0714				
3.00 - 3.49				.3493	2.0	2	2
	2.995	-1.4127	.4207				
2.50 - 2.99				.0752	.5	-	-
	2.495	-2.6412	.4959			6	6

$\bar{X}$ = 3.57

chi square = 0 (3 df)

H_o chi square = 11.345 (3 df, . 01)

s = .407

CHART NO. 14D

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SPRING 1967 TO SUMMER 1968: BARTLETT'S TEST OF HOMOGENEITY OF MARIANCES OF BROAD FIELD COURSE GROUPS

BROAD FIELD COURSE GROUPS	SUM OF SQS. ($f_i s_i^2$)	DF (f_i)	MEAN SQUARES (s_i^2)	LOG s_i^2	f_i LOG s_i^2	RECIPROCALS ($1/f_i$)
Natural Sciences	1.6056	9	.1784	-.75139	11.2617	.1111
Social Sciences	3.4650	15	.2313	-1.36418	20.4615	.0666
The Humanities	.9930	6	.1655	-1.21880	7.3128	.1666
a = 3	6.0636	30			39.0360	.3443

$\bar{s}^2 = \Sigma f_i s_i^2 / \Sigma f_i = .2021$ (LOG .2021 = -1.30557)

(Σf_i) LOG $\bar{s}^2 = -39.1650$

$M = (2.3026) \quad (\Sigma f_i) \text{ LOG } \bar{s}^2 - \Sigma f_i \text{ LOG } s_i^2$

$M = -.2970$

$C = 1 + 1/3\,(a - 1) \quad (\Sigma 1/f_i - 1/f_i)$

$C = -1.4266$

chi square = $M/C = .2081$ $\qquad H_o <$ chi square = 9.210 (2 df, .01)

CHART NO. 15

BOARD OF EDUCATIONAL DEVELOPMENT CURRICULUM, SUMMER 1967 TO SUMMER 1968 AND LOWER DIVISION AND UPPER DIVISION COURSES, SUMMER 1967 TO SUMMER 1968: A COMPARISON OF LETTER GRADE DISTRIBUTIONS AND OF GPI'S

LETTER GRADES	BED COURSES		LOWER/UPPER DIVISION COURSES	
	N	%	N	%
A & A†	184	44.7	36,159	18.5
A-	76	18.4	19,262	9.9
B†	39	9.5	20,778	10.7
B	56	13.6	36,681	18.8
B-	15	3.6	18,160	9.3
C†	5	1.2	14,443	7.4
C	4	1.0	23,546	12.1
C-	4	1.0	7,114	3.6
D†	-	-	1,811	*
D	-	-	4,433	2.3
D-	-	-	990	*
F	1	*	4,253	2.2
I	28	6.8	7,310	3.7
TOTAL	412	100 0	194,940	100.0
GPI	3.35		2.79	

* Less Than 1%

t Test: t= 10.9804 H_o t = 2.3338 (400 df, . 01)